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Report

OF THE

Botanical Survey of India

FOR

1949-50.

PRINTED AT THE AGRA UNIVERSITY PRESS, AGRA

ANNUAL REPORT OF THE BOTANICAL SURVEY OF INDIA FOR THE YEAR 1949-50

1. **Systematic Botany Section** : Mr. V. Narayanaswami, M.A., Asstt. for Systematic, retired from the 28th., September, 1949 and was re-employed in the same post from that date, in which post he continued till the end of the year. Mr. N. P. Chowdhury, whole-time instructor under the Training Scheme, continued in the post upto 1st., October, 1949, from which date his services were terminated as a result of the abolition of the Training Scheme at the Herbarium of the Indian Botanic Garden. Mr. A. T. Banerjee, Head Clerk of the Botanical Survey of India, was transferred to this Section with effect from 21st., December 1949, for the purpose of attending to the increased clerical work at this end. Dr. K. Biswas as usual, continued to supervise the work of this section including the trainees and the other interests of the Government of India at the Herbarium of the Indian Botanic Garden, Calcutta.

2. **Training Scheme** : The Training Scheme in Systematic Botany and Taxonomy which had been in operation from the 15th., June 1946, was abolished with effect from the 1st., October 1949. The temporary staff entertained for working the above scheme was also disbanded with effect from that date. The six trainees of the second batch completed their training of two years and left on the 15th., July 1949. Out of the eight candidates for selected training in the third batch, only three reported for training at the herbarium on the 1st., June 1949, of which one had resigned from the training from the 1st., August, 1949. On the abolition of the Training Scheme at the Herbarium, the remaining two trainees were transferred to the Forest Research Institute, Dehra Dun.

3. **Botanical tours** : The trainees of the second batch were taken out in two parties, one to Buxa Duars of the Jalpaiguri District of Bengal and the other to the Sikkim territory as far as Nathu La, the eastern border of Tibet, under the leaderships of Mr. V. Narayanaswami and Dr. K. Biswas respectively.

The two trainees of the third batch were taken out by Mr. V. Narayanaswami to the Northern forest divisions from South of Jubbalpore to Asirgarh in Khandwa district, including the plateau of Pachmarhi. They also examined the aquatic vegetation round about the island of Bombay.

3. (*a*) About 6500 specimens were collected in these botanical excursions. The month of May, when the Buxa Duar region was explored, appeared to be the ideal time and season for plant collections in that region. Preliminary identification of the Buxa Duar collection has yielded more than

840 species of plants. More than half of these appear to be new records for the hitherto known Flora of Bengal. A number of medicinal plants of known therapeutic value grow in profusion in this part of Bengal. They are *Rauwolfia serpentina*, *Dichroa febrifuga*, *Brucea mollis* and *Helminthostachys zeylanica*. About two dozens of living orchids, with attractive flowers collected from Buxa Duars, have been added to the orchid collcction of the Indian Botanic Garden.

3. (*b*) *Jasminum grandiflorum* L. the "Chameli" and *Micromeria biflora* the important essential oil yielding plants, so far recorded from the temperate North-Western Himalayas, occur in great profusion as undergrowths in the deciduous forests of the Pachmarhi plateau. Besides these, a *Berberis* sp. probably new and closely related to *B. umbellata*, *Clematis triloba*, *Thalictrum foliolosum* and *Chirita bifolia* Don, all typical denizens of the temperate Himalaya, also occur on this plateau. When the collections of this expedition are fully worked out, further new records are expected. The occurrence of temperate Himalayan plants on the plateau of Pachmarhi lends strong support to the theory that the high mountain tops of the Pareshnath Hill, Hills of Chota Nagpur and the Vindhya mountains have served more or less as congenial spots for the migration of some of the Himalayan plants. More systematic and intensive plant surveys in these little explored areas, would certainly contribute very useful data on the vegetable resources for the Industrial and economic development of our country.

4. **Scientific workers and visitors** : Several specialists from the various departments like the Geological Survey of India, the Forest Research Institute, Dehra Dun, Sugar-cane Breeding Station, Coimbatore and from institutions like the Presidency College, Calcutta, Dacca University, London University and many other Indian Colleges worked in the herbarium for varying periods. His Excellency Dr. Kailash Nath Katju, Governor of West Bengal, the Hon'ble Dr. B. C. Roy, the Chief Minister, Bengal and the famous scientists like Sir Hobert Robinson, N. L. and Lady Robinson of England, Dr. (Madam) J. Juliot Curie, N. L. and Dr. F. Juliot, N. L. of France, Dr. W. Wngelhardt and Dr. V. Butrove of U. S. S. R. were some of the notable visitors to the Herbarium and the Garden.

5. **Herbarium work** : (*i*) With the collaboration of the staff of this Section and that of the Herbarium about 5000 specimens had been identified of which more than 2000 belonged to the extra departmental correspondents and the rest to the departmental collections. Several specimens from the foreign herbaria were obtained in exchange for the various duplicate specimens sent from this herbarium. Different types of botanical materials were supplied for research purposes to various Indian and foreign workers.

(*ii*) 28596 herbarium sheets were stamped and numbered, 4603 sheets

were incorporated, 2412 specimens were mounted, 9339 sheets repaired and 55 genus covers and 4283 species covers were changed.

6. **Research work** : Lessons on field survey, ecology and water plants and those on field study and collections, botanical descriptions and nomenclature, correlation and identification of specimens and those on plant geography were given to the trainees by Dr. K. Biswas Mr. V. Narayanaswami and Mr. N. P. Chowdhury respectively. *Dipterocarpus* and the allied genera of *Dioticarpus*, *Balanocarpus* and *Hopea* were studied by one of the trainees of the second batch.

7. **Supply of Information** : This section continued to maintain its services to the agriculturists, foresters, horticulturists, industrialists, Government departments and all those interested in plants and vegetable resources of the country in India and abroad, as a Bureau of Information and advice on botanical matters and all the allied branches of Botany. Whether *Stephania cepharantha* Hyata, a Formonsan moon seed plant, which is alleged to be a remedy in Japan for "Pulmonary tuberculosis", occurred anywhere in India was however one of the many enquiries of public importance. Though this plant does not occur in India, its closest ally, *Stephania japonica* Miers, occurs quite commonly all over India, whose biochemical assay has revealed more or less similar chemical constituents as in *Stephania cepharantha*. *Crataeva religiosa* as a specific remedy for Cholera is receiving attention.

8. **Publications** : A supplementary note to the subject matter connected with Sir Joseph Banks' letters relating to the establishment of the Royal Botanic Garden, Calcutta and its history and a summary of the 150th Anniversary Volume of the Royal Botanic Garden, Calcutta by Dr. K. Biswas were sent to the Asiatic Society of Bengal for publication. The paper "Notes on the distribution and systematic position of Indian species of Dipterocarpus" by P. V. Bole was brought up-to-date. The paper on "Dioscoreas and their value in Dietary" by M. A. Sampatkumaran and K. Biswas and the paper on "Indian S*argassums*" by K. Biswas and first batch trainee A. K. Sarma were sent for publication. The article for "Botanical notes for the symposium on the 'Satpura Theory' prepared by K. Biswas and M. A. Sampatkumaran was revised thoroughly and sent out for publication to Dr. S. L. Hora, Director, Zoological Survey of India. Botanical publications in the journal of the Department of Science, Calcutta University, N. S. Vol. I, Nos. 1-4 were abstracted for the Editor, Biological Abstracts at his request and sent out for publication in the abstracts.

Parts I and II of Vol. XV of the Records of Botanical Survey of India on "the Common Fresh and Brackish Water Algal Flora of India and Burma" with a Catalogue of the Indian Myxophyceae, Chlorophyceae, Xanthophyceae and Bacillariophyceae by Dr. K. Biswas were published during

the year. The "Bharatiya Banaushadi" an exhaustive treatise on Indian medicinal plants in Bengali by Dr. K. Biswas and Sri Ekkari Ghose passed through the final stages of proof and shall soon be published by the Calcutta University. "Marine algae and food problem" (Science and culture 15 (8), 1949) "In the Woods and Temples of South Burma" (Puja Number, Hindusthan Standard) were also published by the writer. The following articles by the same writer were in the press, (i) "The Microscopic life forms in fresh water", (ii) "The Flora of the Ballygunge Science College" and (iii) "Prospects of India Rubber and Para Rubber in India". A paper on "The Subalpine and alpine vegetation of the Sikkim Himalaya by Dr. K. Biswas was contributed to the Botany Section of the 37th meeting of the Indian Science Congress held in Poona.

As a result of the new awakening of interest in the study of Provincial Floras, 68 sets of J. F. Duthie's Flora of the Upper Gangetic Plain, U. P. consisting of 340 volumes were sold out to the Public. Similarly several volumes of Pre-1937 publications of the Records of the Botanical Survey of India were also sold out. A total revenue of Rs. 1009-4-0 was thereby realised and credited to the Government.

The distribution of the Annual Reports for the years 1941-42 to 1947-48 which was held up during the war period, was completed during the year. The Annual Report for 1948-49 was printed during the year, but its distribution could not be undertaken. The number of copies to be distributed exceeded the pre-war annual average by about 200 a fact indicative of the growing interest in the affairs of the Botanical Survey both in India and abroad.

9. **Review of the progress of Botanical studies in India** : It was customary to review here briefly the extra departmental contributions to Indian Botany, but the matter is too much to be discussed in this short report. The pre-war strength of contributions on Indian Botany has not been regained completely though the contributions to our knowledge of Indian Botany have been quite satisfactory. Dr. N. L. Bor has published 15 new species of Indian grasses from the Kew Herbarium during the year.

Sd/- K. Biswas,
Superintendent, Indian Botanic Garden.

Summary.

Botanical explorations carried out in connection with Training Scheme in (1) the Buxa Duars of the Jalpaiguri district, West Bengal, (2) the Sikkim territory as far as Nathu La and (3) the Northern forest divisions of the Central Provinces have brought to light very interesting assemblages of economically important plants.

This section with this skeleton staff continued its services as a Bureau of plant information and introduction. The common occurrence in India of *Stephania japonica* Miers, the closest ally of the Formosan plant, *Stephania cepharantha* Hayata, which is alleged to be a remedy in Japan for Pulmonary tuberculosis, is one of the important informations supplied by this department.

About 5000 specimens have been identified and many specimens from abroad were obtained on exchange basis. The routine work of stamping and numbering, mounting, repairing and incorporating of herbarium sheets had been carried out.

The 'Training Scheme' which for some time provided the necessary impetus to plant exploration work in this Botanical Survey of India, was abolished in the middle of the year. A new awakening for the knowledge of Provincial Floras as evidenced by a bumper sale of some of the published floras, chiefly of the Upper Gangetic Plain, was a notable feature during the year. Of several publications during the year, Parts I and II of Vol. XV of the Records of the Botanical Survey of India were the chief publications in two monographs under the titles of "Common Fresh and Brackish Water Algal Flora of India and Burma" and a "Catalogue of Indian Myxophyceae, Chlorophyceae, Xanthophyceae and Bacillariophyceae" respectively.

Sd/- K. Biswas,
Superintendent, Indian Botanic Garden.

INDUSTRIAL SECTION, INDIAN MUSEUM, CALCUTTA
REPORT FOR THE YEAR 1949-50

1. **Public Gallery** : The year under review has been notable for increased display in the Industrial Section of the Indian Museum, both of a permanent and temporary nature ; and the chief event of the year has been the introduction of a "Plant Portrait Gallery" in which water colour portraits of economic plants prepared departmentally are on exihibition. This new feature has given an added popularity to the exhibition galleries. A further display feature is the addition of models illustrating "Sugar-cane and Tea-Industry" at a total cost of Rs. 850/-.

A great deal of steady work has been carried out on the permanent and reference collections for their proper maintenance. More than 19,000 exhibits were treated, 993 individual labels and 236 descriptive labels were prepared and 3,323 labels were replaced. The value of these collections is appreciated in dealing with the numerous enquiries which have passed through this department in the past twelve months. These have included advice to commercial concerns, co-operation with research departments in their researches, identification of samples received from various parties etc.

In the Timber Section, 251 economic timbers were exhibited. 90 other timber exhibits obtained from South Indian forests have also been added to the general collection.

2. **Fixtures** : 250 picture frames were purchased at a total cost of Rs. 2,025/- from the grant allotted by the Trustees of the Indian Museum, from the "Post-war Indian Museum Trust-Fund".

3. **Accessions** : Over 530 accessions were made during the year showing an increase of about 20% over the previous year. These include 11 statistical charts illustrating the statistical position of major food grains in the various provinces and one chart on "Commercial crops of the Indian Union", agricultural varieties of Potatoes (8) ; Paddy from various provinces in India (84) ; Wheat (10) ; Pulses (19) ; Millets (68) ; Gur and Jaggery, Fibre samples including Cotton varieties (19) ; exhibits illustrating staple length of cotton strains (12) ; Mats and mat-industry and several other specimens of oil and oil-seeds, spices, crude-drugs, dyes and tans, etc. Particular reference amongst a considerable list of additions might be made to the collection of 33 exhibits on Bamboo, to represent this valuable forest product which did not receive adequate attention in the past few years.

Other accessions of interest include 8 samples of dried sea-weeds with Agar-Agar samples prepared from them and hand-made paper from the Research centre, Poona. The collection of photographs, departmental photo negatives on ecology and industries and several colour slides made during the year were also properly arranged and indexed.

The rapid growth of collections is now pressing hard upon available accommodation. Proper storage and study space is nevertheless essential no less than the gallery space.

4. **Field explorations** : Hitherto the National collection in the Indian Museum has possessed, strangely enough, no single example of Marine Algae from the Indian coasts. Attempts were, therefore, made to fill up these gaps by undertaking coastal surveys in India. It is hoped that the survey now initiated would be continued and the Museum, as elsewhere, would work to that end so as to bring about a major advance in educational and cultural facilities.

During the year the coasts of Tuticorin, Hare Island, Cape Comorin and a few other places in South India were surveyed by the Curator. The wealth of excellent material, assiduously collected from different regions, during these excursions enriched the collections and it is to be emphasised that to this extent the survey has made a definite contribution. Further research on these classified materials numbering about 400 fluid collections and 1050 herbaria, is greatly hampered by our present lack of sufficient equipment. It is, however, earnestly hoped that this difficulty will soon be overcome, and we would be able to proceed on towards the fulfilment of the essential purpose for which these collections have been made.

The Curator also visited some of the important industrial centres in South India and much valuable information and material were gathered in respect of the "Senna" and "Coir" industries.

5. **Plant introduction** : Viable seeds of what is popularly known as "Milk-tree" or "Cow-tree" (*Brosimum galactodendron* D. Don) were procured from Venezuela, S. America for experimental cultivation in India. The Milk-tree is an interesting species with, perhaps, great potentialities. The tree on tapping yields a kind of good quality milk, which is reported to be highly nutritious. The seeds procured were distributed to 12 centres in India and one abroad for sowing. Interesting reports were received from these centres though the seeds had been in the soil for several months, they had not yet germinated, but were, however, quite healthy. The seeds sown by the writer in the Indian Museum premises, however, showed signs of germination. Their further progress is watched with great interest. It would seem

highly desirable that concerted efforts are made by Govt. and other institutions to successfully grow this highly interesting tree in India.

6. **Educational services and popular lectures** : The Industrial Section of the Indian Museum has been co-operating with the schools and universities in every possible way in their educational activities. There is scope for increased co-operation with the introduction and expansion of botanical galleries to deal with general matters such as classification, distribution of individuals or the relationships of species in space and time, agriculture, forestry, ecology and evolution, as envisaged in the reorganisation scheme. The special demonstration lectures initiated by the Curator were well received. A demonstration lecture on Indian Marine Algae was given by the Curator to a batch of 50 botany and biology students of the Lady Brabourne College. 28 officer students of the Forest College, Dehra Dun, U. P., led by two officers and another batch of students from the Department of Pharmaceutics, Benaras Hindu University, were on an educational visit to the Indian Museum, Calcutta. At the request of the Trustees of the Indian Museum, the Curator delivered a popular lecture on "Sea-weeds and their Industries" on the 26th February 1950. This lecture was well attended and highly appreciated.

7. **Enquiries attended and supply of materials** : Enquiries continue to increase, those relating to medicinal and other economic plants being particularly numerous. Relevant information on (*i*) the source of supply of viable seeds of *Hydnocarpus wightiana* Bl. and *Gossypium* required for experimental cultivation, crude drugs in commercial quantities, bark of *Holarrhena antidysenterica*, Aquamarine, Rice-roots, species of *Plantago*, *Cleistanthus collinus*, etc., (*ii*) the extraction of Arrow-root, (*iii*) cultivation of *Canna edulis*, *Catha edulis*, Camphor-tree, *Juglans regia*, (*iv*) the fungi on Tea plants, (*v*) Fiber-yielding plants suitable for introducing into the forest regions in Bombay, (*vi*) scientific and vernacular and trade names of economic plants, etc., were furnished and some of the beneficieries being Mr. Nico C. Simconoides, Alexandria, Egypt ; the Scientific Officer, UNESCO, New Delhi ; the Chief Editor, Council of Scientific & Industrial Research Dictionary of Economic Products, New Delhi ; the Director General of Commercial Intelligence, Calcutta ; the Silviculturist, Poona : the Managing Director, Nallamalai Tea Estates ; the Indian Council of Pharmacy, Department of Chemical Technology, Bombay ; Messrs. New India Distributing Corporation, Bombay ; Messrs. Alembic Commercial Works, Ltd., Baroda ; Messrs. Hindusthan Herb Supply Co., Bombay ; Messrs. Volkart Bros., Bombay ; Messrs. Indigenous Drug Supply Corpn., Calcutta and Messrs, Diana Trading Corporation, Calcutta.

The requests for the supply of authentic research & museum materials of a number of groups including medicinal plants, ornamental plants, plant-

fibres and various other economic plants and plant products have been numerous from parties both in India and abroad. This department discharged this function and maintained a high level of efficiency. Some of the institutions to which services rendered in this direction include—the Department of Pharmacy, University of Nottingham, England ; Indiana University, Bloamington, Indiana, U. S. A., : Ministero de Agriculture Y Cria, Venezuela ; Forest Department, Assam ; Central Drugs Laboratory, Calcutta; Presidency College, Calcutta ; Government Agricultural College, Kanpur and Government Museum, Madras. The usefulness of this Museum is thus being increasingly appreciated.

8. **Library** : During the year 1003 publications, including books and journals have been added to the library. 30 books were purchased and 233 books were loaned out. Cataloguing and indexing of the existing collections, as well as new books has continued. 11,362 library collections were so far accessioned, thus completing the accessioning of the major collections of the library. Index-cards including author, subject index and shelf list cards were prepared for 2167 volumes. This new feature should facilitate the use of the library and help to make its resources more accessible.

9. **Herbarium** : 1,237 herbarium sheets were cleaned and treated ; 906 specimens were incorporated ; 1,283 specimens were mounted ; 768 herbarium sheets were repaired and 404 genus covers renewed. The identification and labelling of specimens in the herbarium were also carried on as usual.

10. **Visitors** : During the year under review, 901305 visitors were recorded as against 702469 in the previous year, thus showing a 28% increase over those of 1948-49. The usefulness of this Museum as an educational and entertainment centre would thus seem well appreciated.

11. **Finance** : The total budget grant during the year 1949-50 was Rs. 97,000/- out of this a sum of Rs. 92,103/- was spent and the balance was surrendered to the Government. A sum of Rs. 12,000/- was available from the Compensation and Post-War Indian Museum Trust Fund, out of which a sum of Rs. 6,641/- was spent during the year for the restoration of the public gallery.

12. **Staff** : The post of the Director, Botanical Survey of India, being not filled up, his duties were also discharged by me in so far as this office is concerned. I served as an Ex-officio Trustee in the Board of Trustees, Indian Museum and also as its Honorary Secretary from 10-5-1949.

All the members of the staff of this department worked satisfactorily.

Sd/- K. S. Srinivasan,
28-9-50,
Curator,
Industrial Section, Indian Museum.

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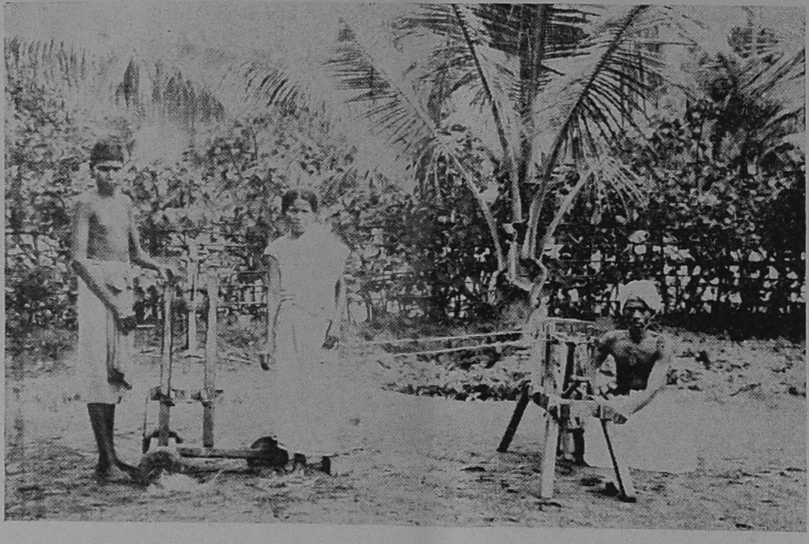

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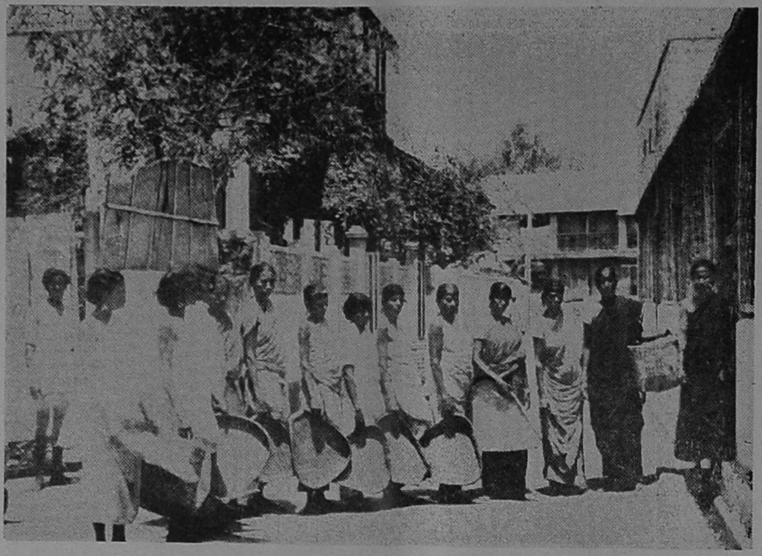

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EXPLANATION OF PLATES.

PLATE NO. I **"SENNA" INDUSTRY OF TINNEVELLY FAME**

1. Sifting and winnowing "Senna" is an important process in the industry, which claim for the purity of the product. Women are mostly employed for this on point of efficiency-cum-economy.
2. "Grading" senna is essential for its quality which has a world reputation.
3. Weighing senna for marketing.

PLATE NO. II. **COIR INDUSTRY IN UNITED STATES OF COCHIN-TRAVANCORE**

1. On the banks of the back-waters in Travancore, have developed centres of Coir industry, renowned for their products. Picture shows retting of cocoanut-husk in water, where they lie for several months before extraction of fibre.
2. Beating the retted husk with wooden mallets for extracting the fibre (Coir).
3. The cleaned fibre is spun and twisted by means of special wheels of simple construction with high efficiency.

PLATE NO. III. **SOME LITTLE KNOWN RHODOPHYCEAE OF SOUTH INDIA**

1. *Botryocladia leptopoda* (J. Ag.) Kylin.
2. *Acrosorium uncinatum* (J. Ag.) Kylin. (with tendril-like hooks) epiphytic on Gracilaria.
3. *Neurymenia fraxinofolia* (Mert.) J. Ag.